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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,444	07/29/2003	Paul S. Danielson	SP03-091	5737
22928	7590	02/07/2007		
CORNING INCORPORATED			EXAMINER	
SP-TI-3-1			YU, MELANIE J	
CORNING, NY 14831				
			ART UNIT	PAPER NUMBER
			1641	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/07/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/629,444

Applicant(s)

DANIELSON ET AL.

Examiner

Melanie Yu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 7, 8 and 10-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 8 and 10-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment filed 9 November 2006 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 1-3, 5, 7, 8, 10, 13-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Dela Ruye (US 4,339,541) further in view of Müller et al. (US 6,306,589) and Sega et al. (US 6,251,548).

Regarding claims 1-3, 5, 18 and 19 Pantano et al. teach a porous substrate comprising: a nonporous support (par. 2); and an inorganic porous region on a surface of the support (par. 25, 26, 53), the inorganic porous region having a surface capable of immobilizing probe molecules (par. 7), the inorganic porous region having a tint and exhibiting a reduced level of auto-fluorescence of at least about 50% relative to a comparable non-tinted porous substrate surface (par. 8), which encompasses the recited reduced auto-fluorescence values of at least about 15%, at least about 20-25%, and at least about 50%. The reduced relative auto-fluorescence level in RFU (less than 70 self

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fluorescent units) is at least an order of magnitude over the non-tinted porous substrate surface (relative self fluorescent units are relative fluorescent units; par. 0021), and the reduction is over a wavelength range from about 470 and 700 nm (fluorescent dyes are FluorX, Cy3 and Cy5 which have an emission window between 470 nm and 700 nm, and is the same window over which the auto-fluorescence is reduced; Fig. 2 – excitation and emission data for fluorescent dyes; Fig. 3 – auto-fluorescence reduction over range; par. 41 and 49), which encompasses the recited ranges of 400 to about 720 or about 420 nm to about 700 nm. Pantano et al. fail to teach the tint comprising cobalt oxide and nickel oxide.

Dela Ruye teach adding a colorant of nickel oxide and cobalt oxide, which absorb light in the visible spectrum, to a glass substrate (col. 4, lines 27-58), in order to provide coloring to a glass substrate.

Müller et al. teach that color may be added to a glass substrate to provide a substrate with low autofluorescence (col. 3, lines 4-23) and a substrate that absorbs light provides decreased autofluorescence (col. 2, line 54-col. 3, line 23).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the tinted substrate of Pantano et al, nickel oxide and cobalt oxide as taught by Dela Ruye, in order to provide increased substrate absorbance of visible light (Dela Ruye, col. 4, lines 62-68) which provides increased assay accuracy because background fluorescence is reduced (Müller et al., col. 3, lines 4-12). Although Dela Ruye teaches that cobalt oxide is CoO (cobalt (II) oxide) and does not specifically teach that the cobalt oxide being Co₃O₄ (cobalt (III) oxide), Sega et al. teach that cobalt (II) oxide and cobalt (III) oxide can be used to produce a tint (col. 5, lines 43-55). Therefore, one having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent tinting technique and since the same tinting effect would have been obtained. The use of alternative and functionally equivalent

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techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components.

With respect to claims 7, 8, 10, 20 and 21, Pantano et al. teach a tinted porous region of borosilicate glass consisting essentially of the weight percentages of the following components: SiO₂: 65-75 %, Al₂O₃: 0-3%, B₂O₃: 0-5%, K₂O: 5-15%, MgO: 0-6%, CaO: 0-10%, SrO: 0%, BaO: 0.1-5%, Sb₂O₃: 0-2% [0053], all of which weight percentages fall within the recite ranges of claims 10 and 21. Although Dela Ruye does not teach the specific amounts of C₃O₄ and NiO, it has long been settled to be no more than routine experimentation for one of ordinary skill in the art to discover an optimum value for a result effective variable. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum of workable ranges by routine experimentation" Application of Aller, 220 F.2d 454, 456, 105 USPQ 233, 235-236 (C.C.P.A. 1955). "No invention is involved in discovering optimum ranges of a process by routine experimentation." Id. at 458, 105 USPQ at 236-237. The "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." Since applicant has not disclosed that the specific limitations recited in instant claims 7, 8, 10, 20 and 21 are for any particular purpose or solve any stated problem, and the prior art teaches that the amount of tinting material may be altered in order to provide different amounts of absorbance, absent unexpected results, it would have been obvious for one of ordinary skill to discover the optimum workable ranges of the methods disclosed by the prior art by normal optimization procedures known in the tinting art.

With respect to claim 13, Pantano et al. teach a tinted region having an average auto-fluorescence background for Cy3 and Cy5 channels [0041] of up to about 50% RFU of said un-tinted porous substrate [0008]. Claim 13 recites a GAPS-coating process, which

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fails to provide further product limitations on the product of claim 1, and is therefore not considered part of the product of claim 13.

Regarding claims 14-17 and 23, Pantano et al. teach a number of biological DNA probes attached at defined locations on or within the porous layer [0062], wherein the defined locations assume a microarray format of 10,000 probe droplets/cm² [0035], which encompasses the recited ranges of microspots of at least 1 and at least 10 microspots per cm².

3. Claims 9, 22, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Dela Ruye (US 4,339,541) further in view of Müller et al. (US 6,306,589) and Sega et al. (US 6,251,548), as applied to claim 8, and Mizuno et al. (US 2002/0042068).

Pantano et al. in view of Dela Ruye further in view of Müller et al. and Sega et al. teach a tinted porous region of borosilicate glass consisting essentially of the weight percentages recited in claim 9.

Mizuno et al. teach borosilicate glass (par. 0087) comprising Fe₂O₃ in a weight percent of 0.11% (table 1, column C), which is encompassed by the recited range of 0-10 wt. %, in order to provide to provide further reduced light absorption.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the substrate of Pantano et al. in view of in view of Dela Ruye further in view of Müller et al. and Sega et al., Fe₂O₃ in a weight percent of 0.11% as taught by Mizuno et al., in order an inexpensive glass made of fewer raw materials.

4. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Dela Ruye (US 4,339,541) further in view of Müller et al. (US 6,306,589) and Sega et al. (US 6,251,548).

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Pantano et al. in view of in view of Dela Ruye further in view of Müller et al. and Sega et al. fail to specifically teach the recited pore sizes of the porous material. However, it has long been settled to be no more than routine experimentation for one of ordinary skill in the art to discover an optimum value for a result effective variable. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum of workable ranges by routine experimentation" Application of Aller, 220 F.2d 454, 456, 105 USPQ 233, 235-236 (C.C.P.A. 1955). "No invention is involved in discovering optimum ranges of a process by routine experimentation." Id. at 458, 105 USPQ at 236-237. The "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." Since applicant has not disclosed that the specific limitations recited in instant claims 24 and 25 are for any particular purpose or solve any stated problem, and the prior art teaches that pore size of a porous material may be varied in order to alter the surface area for immobilizing probes, absent unexpected results, it would have been obvious for one of ordinary skill to discover the optimum workable ranges of the methods disclosed by the prior art by normal optimization procedures known in the porous material art.

5. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view in view of Dela Ruye (US 4,339,541) further in view of Müller et al. (US 6,306,589), Sega et al. (US 6,251,548), and Mizuno et al. (US 2002/0042068), as applied to claims 1 and 8, and Young et al. (US 6,391,809).

Pantano et al. in view of in view of Dela Ruye further in view of Müller et al., Sega et al. and Mizuno et al. teach a borosilicate glass composition, but fail to teach the coefficient of thermal expansion.

Young et al. teach borosilicate glass having a coefficient of thermal expansion of $30\text{--}40 \times 10^{-7}/^{\circ}\text{C}$, in particular a borosilicate lamp glass being $38 \times 10^{-7}/^{\circ}\text{C}$ (col. 1, lines 51-53), in

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order to provide a fusion-type seal with a low softening temperature while also maintaining a low to medium coefficient of thermal expansion.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the borosilicate glass composition as taught by Pantano et al. in view of in view of Dela Ruye further in view of Müller et al., Sega et al. and Mizuno et al., a coefficient of thermal expansion of $38 \times 10^{-7}/^{\circ}\text{C}$ as taught by Young et al., in order to match the coefficients of thermal expansion between a borosilicate non-porous glass substrate and the porous inorganic layer.

6. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Dela Ruye (US 4,339,541) further in view of Müller et al. (US 6,306,589), Sega et al. (US 6,251,548) and Tanner et al. (US 2003/0003474).

Pantano et al. in view of in view of Dela Ruye further in view of Müller et al. and Sega et al. teach a borosilicate glass substrate with the recited weight percentages and inorganic borosilicate porous glass, but fail to teach the support comprising aluminosilicate glass or the porous material being borosilicate frit.

Tanner et al. teach a support of borosilicate glass or aluminosilicate glass (par. 11), in order to provide a substrate support.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include as the substrate of Pantano et al. in view of in view of Dela Ruye further in view of Müller et al. and Sega et al., an aluminosilicate glass as taught by Tanner et al. One having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent substrate and since only the substrate material would have been obtained. The use of alternative and

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functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components.

With respect to claims 28 and 29, Tanner et al. teach the porous glass being borosilicate made from frit (par. 57) and Pantano et al., as described above, teach the composition of the borosilicate recited in claim 29.

Response to Arguments

7. Applicant's arguments with respect to claims 1-3, 5 and 7-26 have been considered and have been withdrawn, but are moot in view of the new ground(s) of rejection. Upon further consideration, a new ground(s) of rejection is made in view of applicant's amendment requiring the tint to comprise both cobalt oxide and nickel oxide.

Conclusion

No claims are allowed.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Melanie Yu
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